

"The Royal Commission on Science, presided over by the Duke of Devonshire, has, for nearly three years, been most assiduously engaged in collecting a body of information of infinite value, and they will no doubt forward many important recommendations on the evidence they have taken; but for my part, as one deeply interested in their proceedings, to which I have contributed largely as a witness, I do not hesitate to say that if they only succeed in obtaining the creation of a Science Minister, that result alone will amply repay the country for the cost of their investigations.

"Let this be done, and we should cease to witness the farce of consulting the Chancellor of the Exchequer about observing eclipses of the sun, the Prime Minister about scientific Arctic expeditions, and the Treasury about tidal reductions. We should perhaps, too, then perceive that overworked Law Officers are not the best managers of a great, or what should be a great, technical Museum, and that fifty irresponsible gentlemen, however eminent individually, ought not to be entrusted with the grandest collection of Art and Natural History in the world. Nor would a wise statesman like Lord Derby fail to perceive, with all science concentrated under one view for his inspection, that a private local Society will prove no match for the complete and powerful State systems of Germany, France, and other Continental nations."

PINK AND WEBSTER'S "ANALYTICAL CHEMISTRY"

A Course of Analytical Chemistry (Qualitative and Quantitative). By William W. Pink and G. E. Webster. (London: Lockwood & Co., 1874.)

THIS work forms a volume of Weale's Rudimentary Series, and is advertised "as specially adapted for the use of those students who intend competing in the Advanced or Honours Stage Examinations (Inorganic Chemistry) of the Science and Art Department, also for preparing those intended to sit for the higher class examinations at Colleges, Public Schools," &c. The success which several well-known serial publications of a similarly special nature have deservedly had, appears to have stimulated the publishers of Weale's Series to embark in this enterprise. As the excellence of most of their former publications will be generally admitted, we can only regret that a literary (?) production displaying such deplorable ignorance should ever have found a place in their series. It has rarely been our duty to pass judgment on a more carelessly got-up book. Had it not been advertised as specially adapted for the use of the Science Classes under the Science and Art Department, we might have put it aside with a hearty laugh over the many absurd blunders it contains. Since a practice has, however, sprung up of late to cater for the wants of Science Classes, by printing books (sometimes obtained on commission) privately, and advertising them by means of post-cards, at so many postage stamps a copy, whereby these books manage to escape the eye of the reviewer, and as we fear that much mischief is being done by certain cheap cram-books, strung together with a view to save the teacher as much trouble as possible, our readers will perhaps bear with us if we examine the book before us somewhat closely. If rumour speaks true, some teachers manage to teach chemistry—even analytical

chemistry—without ever touching a test-tube or performing the simplest experiments. Questions from previous examinations are eagerly collected and "worked" in the belief that the examiner is sure to give, if not the same questions, at least others of a similar nature. We need not fear giving offence to those earnest and hard-working men, engaged, often on a mere pittance and under most adverse and discouraging circumstances, in imparting a sound knowledge of chemistry in places which would not otherwise be reached by any educational efforts, if we conclude from the course of analytical chemistry before us, that some teachers (Mr. Webster styles himself Lecturer on Metallurgy and the Applied Sciences, Nottingham) are deplorably ignorant of the science they profess to teach.

Beginning on p. 4, we are told that "the term atom is sometimes applied to a compound as well as simple radicals, such as ammonia, hydroxyl, &c.": that "for fixed solids which do not vaporise, the atomic weights are referred to the element lithium, the atomic weight being determined by the amount of heat which any body contains, when it is at the same temperature as lithium, both being the same weight, lithium being considered as seven." On p. 7, "difference of attraction is called the bond affinity, that is, it is assumed that the different atoms possess power, lines of force, or *points of attraction*, called by Dr. Frankland *bonds*." On p. 12, we are informed, that "there are four different forms of notation, or formulæ in present use, two of which are *graphical*, viz. the *glyptic* and *graphic* formulæ. The other two, viz. the empirical and the constitutional or rational, are the symbolic representations." We give it upon the authority of our joint authors, that "Dr. Crum Brown was the first to introduce this form of formulæ, and that it has now been adopted by Dr. Frankland, and generally throughout the kingdom." And on p. 14, we are told, that "students who do not already understand the constitutional formulæ are strongly advised to obtain a complete knowledge of them, not only as an addition to their knowledge, but because the other is now not recognised by many colleges, or *allowed* in many examinations." For fear our authors' inadvertence should lead to further mischief, we may at once state that, to our knowledge, such is not the case, and that the authors are as much in the dark about what is recognised by many colleges or "allowed in many examinations" as they are about chemical analysis.

We can only pick out some of the choicest specimens from the authors' analytical bouquet. Beginning on p. 26, we are told that "deflagration is the arrangement of the crystals of a substance, and is, in ordinary terms, the crackling of a body when exposed to heat;" on p. 28, that "hardly any amount of reading or lecture-hearing can produce a practical analyst, as only practice can make perfect, and therefore the student is strongly recommended to make the experiments himself." We for once entirely agree with the theory, but strongly object to the "practice" of our joint authors. The information on p. 30, that "melted lead cannot be poured even in a cold platinum crucible without spoiling it, and that a drop of lead, tin, or bismuth, falling upon a red-hot platinum vessel invariably makes a hole in it," we owe probably to the sad experience gained by the metallurgical partner in the joint-authorship, and science-students possessing platinum

vessels must surely feel thankful for the hint. Great confusion of ideas seems to prevail, however, on the subject of platinum, for we are told on p. 31 that "platinum combines easily with silica and carbon, so that the contact of platinum crucibles with charcoal at a very high temperature must be avoided," together with several other absurd precautions which we will not quote. On p. 33, there figures an apparatus for rapid filtration in an atmosphere of steam, which we have seen before in Normandy's Introduction to his translation of Rose, and which we should have thought had been superseded long ago by more perfect methods of filtration.

As specimens of analytical knowledge (?) we quote p. 57, "hydrochloric acid gives a precipitate on dilution with water (distilled) if BaCl_2 or $\text{SO}_2\text{H}_2\text{O}_2$ be present;" p. 38, "dilute sulphuric acid contains more lead, and lead is scarcely soluble in concentrated acid;" p. 42, "A solution of baric chloride must be neutral to test-paper, after precipitation by sulphuric acid;" p. 43, "sodic carbonate must completely volatilise;" p. 46, "hydrofluosilicic acid can be obtained from the chemists in india-rubber bottles."

The analytical tables on pp. 57 to 73 are equally deficient and faulty. We are told to test for ammonia, after having ignited on platinum foil; "a watch-glass becomes corroded on the addition of baric chloride to a neutral solution of salts," "hydrobromic acid turns starch-paper blue," "sodic hydrate," on p. 94, "precipitates light-coloured ferric hydrate which turns dirty-green." Upon heating chlorates, p. 115, "a very violent deflagration ensues." The authors appear never even to have prepared oxygen gas.

The quantitative knowledge displayed by the authors is quite on a par with the choice bits of qualitative chemical information so liberally and innocently volunteered by them. We will not tire our readers, however, by any further quotations, but cannot refrain from firing a parting shot or two by quoting from p. 120, where we are told that "Chlorine is prepared by the mixing of salt, hydrochloric acid and manganic oxide; this last, MnO_2 , has no chemical reaction in the last equation;" and from p. 136, on which we are told that "in order to keep the edges of the balance free from rust, it is a very good practice to place inside the case a beaker, half-filled with sulphuric acid or baric chloride." A dialyser is described on p. 171 as "an apparatus having sides and top of gutta-percha, and bottom of parchment, and is used for the separation of urea and other crystallisable salts from urine."

Need we do more than recommend the authors to act upon their own advice (p. 2), and "to speedily endeavour to obtain a complete knowledge of the composition of bodies, and make themselves conversant with the formulæ &c.," of which they exhibit so deplorable an ignorance, before they again venture upon enlightening the public on the subject of chemistry.

THE RACES OF MANKIND

The Races of Mankind: being a Popular Description of the Characteristics, Manners, and Customs of the Principal Varieties of the Human Family. By Robert Brown, M.A., Ph.D., &c. (Cassell, Petter, and Galpin).

THE rapid growth of interest in Anthropology is proved by the appearance, one after another, of popular illustrated works: Mr. J. G. Wood's "Natural History of

Man" in 1868-70, an English translation of M. Louis Figuier's "Human Race" in 1872, and just now (though without the date it ought to have on the title-page) this first volume of a work on "The Races of Mankind." Of these, the productive M. Figuier's book is too worthless to say much of, and the comparison lies between the first and last. Both are valuable, and the ground they cover is so far different, that they may be usefully placed side by side in the ethnologist's library. It will be remembered that Mr. Wood's account of Africa occupied the first of his two volumes, so that his account of the races of Asia, America, Polynesia, &c., had to be disproportionately condensed into the second. Dr. Brown, we trust, will be able to keep his scale more uniform. His first volume treats entirely of American races, and he speaks with personal knowledge of the Esquimaux and North-west tribes, compiling as to other tribes with discretion, and generally from not too hackneyed authorities. Such of Dr. Brown's illustrations as are taken from photographs and real drawings are good, and preferable to the too picturesque and imaginative cuts of Mr. Wood's artists. But Dr. Brown inserts some drawings which he had better for truth and good taste have left out. Thus, the Indian scalping his victim at page 68, though no doubt more like the reality than the engraving in vol. ii. of "Schoolcraft," from which it is a kind of rationalised copy, is a piece of sensational make-up; while on the next page a scene of Indians torturing a captive by a slow fire on his stomach, is still more objectionable. At page 284 is a representation of Conibos shooting turtle; this is evidently a fancy picture, and arrows shot at such an angle would glance off the animal's carapace; the arrows should have been shown of heavier make, and so sent up as to fall almost perpendicularly.

As only the first part of Dr. Brown's work is yet out, it may perhaps be a service to make some suggestions. Native words are sometimes wrongly printed, which gives an air of carelessness to the descriptions they form part of. Thus "inniut" instead of "innuit" (p. 5); "Manco Capas" and "Manià Dello" (p. 119), which appear to be intended for the usual forms, "Manco Capac" and "Mama Oello" (Mr. C. R. Markham would say that "Ccapac" and "Oello" are the really proper forms). At page 274, the account of the "couvade," the custom of the husband being put to bed or otherwise treated with reference to his wife's bearing a child, is compiled very inaccurately. Lastly, though references are generally given where long abstracts have been made from books of travel, Dr. Brown seems somewhat apt to make statements and use arguments without due mention of the sources whence he derived them. One consequence is, that he makes himself personally responsible for any blunder in the matter he thus appropriates. Thus, at page 147 a passage is inserted of which the following is part:—"In the Ladrone Islands, the Spaniards found the natives unacquainted with fire; and when Magellan set fire to the huts of the Marian islanders, they looked upon the flame as a living creature which fed upon wood." Unless my memory deceives me, this passage is copied out of Büchner's "Man in the Past, Present, and Future," and has been already commented on in NATURE, not only as embodying statements which have been disproved,